

POLI ESCOLA SUPERIOR TECNOLOGIA GESTÃO TÉCNICO QUARDA	SUBJECT DESCRIPTION	MODELO PED.013.03
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Course	Topographic Engineering					
Subject	Programming					
Academic year	2023\2014	Curricular year	1	Study period	1st semester	
Type of subject	Compulsory	Student workload (H)	Total: 154	Contact: 60	ECTS	5.5
Professor(s)	Luis Figueiredo					
☒ Area/Group Coordinator ☐ Head of Department	(select)	José Carlos Martins da Fonseca				

PLANNED SUBJECT DESCRIPTION

1. LEARNING OBJECTIVES

Upon completion of the UC, students should be able to:

- Write algorithms using pseudocodes.
- Using the best data structures for each problem.
- Know fundamentals about computers and programming languages.
- Implement algorithms using console and graphical interface

2. PROGRAMME

- Fundamentals of Algorithmic language
 - Algorithmic language
 - Developing phases
 - Syntax
 - Simple variables and structured variables
 - Input and output instructions
 - Control and repetition structures
- Data structures
 - Strings and files
 - Classes
 - Vectors and matrix
- Python programming
 - Computers and programming language
 - Python introduction
 - Basic variables
 - Structural data (vectors, matrix, lists and dictionary)
 - Conditional and loop instructions
 - Input and output functions
 - Using imported files
 - Classes definitions
 - Using text files
 - Numerical computation and graphical visualization

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3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

Content 1 is consistent with objective 1, because the concept of an algorithm is defined, the necessary phases to develop algorithms are presented, the elements of the algorithmic language are described.

Content 2 is consistent with objective 2, because the fundamental data structures used in the algorithms are presented.

Content 3 is consistent with objective 3, because in that chapter a brief introduction to computers is presented and fundamental concepts about programming language are taught.

Content 3 is consistent with objective 4, because in that chapter the Python programming language is taught and libraries are used for numerical computing and controls for the graphical interface.

4. MAIN BIBLIOGRAPHY

Mandatory:

Lecture notes provided by the teacher

Think Python (2a edição) A. B. Downey. <http://greenteapress.com/wp/think-python-2e/>. Livro de distribuição gratuita.

Practical Programming (2nd edition) An Introduction to Computer Science Using Python 3 by Paul Gries, Jennifer Campbell, Jason Montojo <https://pragprog.com/book/gwpy2/practical-programming>

Recommended:

*Magri, J.A. (2003). *Lógica de Programação – Ensino Prático*. São Paulo: Érica.*

*Lopes, A. E Garcia, G. (2002). *Introdução à Programação – 500 Algoritmos Resolvidos*. 5ª Edição. Rio de Janeiro: Elsevier.*

Python 3 Tutorial in PDF - TutorialsPoint http://www.tutorialspoint.com/python3/python3_tutorial.pdf.

ChatGPT

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

Teaching methodologies:

1. *Lecture*
2. *Interactive lesson*
3. *Problem solving*
4. *Project*

Evaluation methodologies:

For all evaluations:

Individual practical work with presentation and report

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

Lecture is in accordance with the objectives because it is necessary to present the theoretical knowledge of the course to students.

Interactive lesson is consistent with the objectives because the interaction of students with the teacher facilitates the learning of concepts. Algorithms are presented focusing on each aspect of its writing phases. Students can question the teacher about any element of the algorithm, exchange and enrich ideas allowing to increase the knowledge that each one has.

Problem solving is consistent with the objectives because it allows the student to apply theoretical knowledge in the writing of algorithms that involves choosing the most appropriate data structures.

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Individual work is consistent with the objectives because the realization of an individual work, its documentation, the presentation and defense allow the student to solidify his knowledge acquired in the course and develop their individual ability to solve problems

7. ATTENDANCE

8. CONTACTS AND OFFICE HOURS

luis.figueiredo@ipq Gab. 9, Tuesday 10:30-13:30, Wednesday 13:30-16:30 Friday 10:30-11-30

9. OTHERS

DATE

18 September 2023

SIGNATURES

Professor

(signature)

Area/Group Coordinator

(signature)